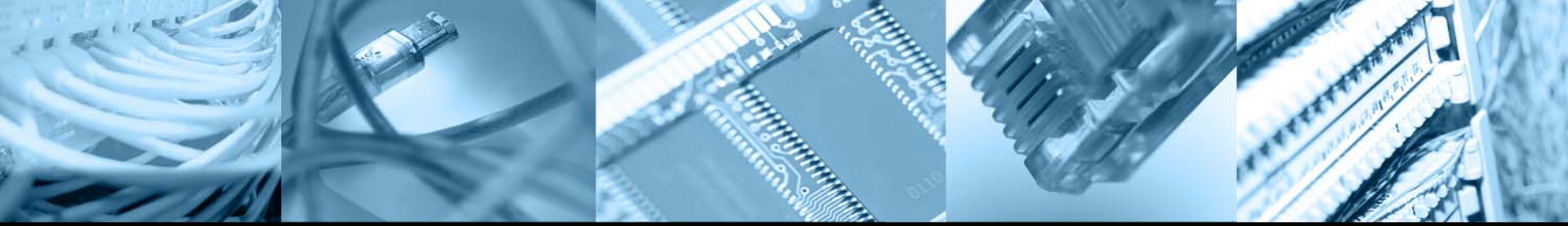


“Interoperability”

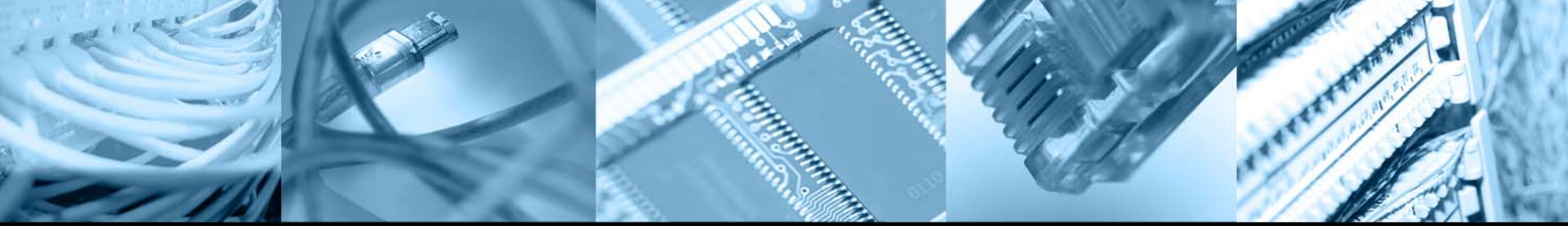
How the term is viewed from different perspectives

- Presented by: David Haines, P.E.
Kimley-Horn and Associates



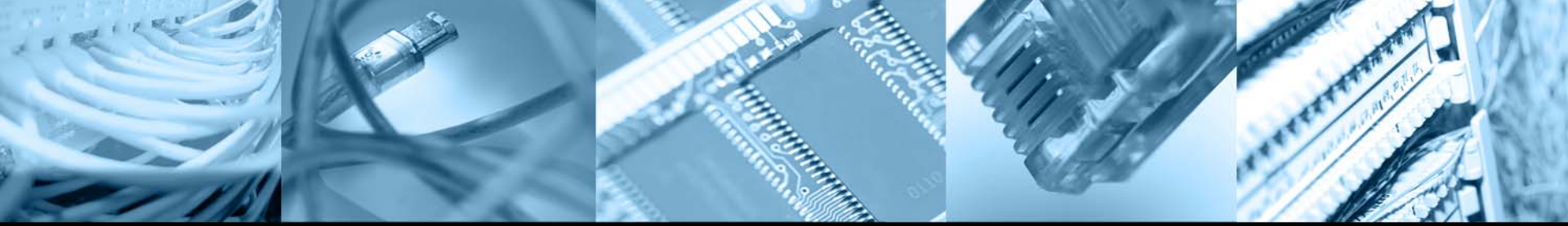
Overview

- Owner's perspective
- Contractor's / Manufacturer's perspective
- Lessons Learned
- Using National Standards
- Design Considerations



Owner's Perspective

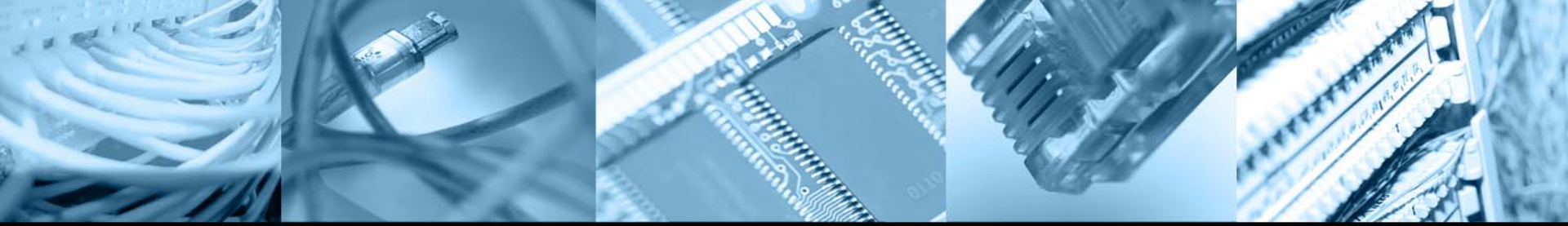
- How would you define interoperability?
- What do you expect to get?



Owner's Perspective

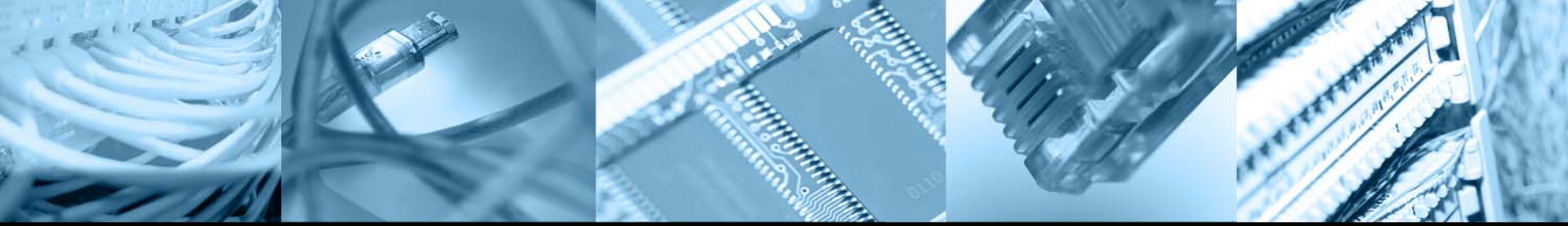
■ Possible Answers:

- ◆ All components work together as one system
- ◆ Equipment is Non-Proprietary
- ◆ Equipment can be provided by multiple manufacturers
- ◆ "Plug & Play"
- ◆ Easier to operate and maintain
- ◆ Lower future upgrade cost
- ◆ Enhanced flexibility to expand/grow



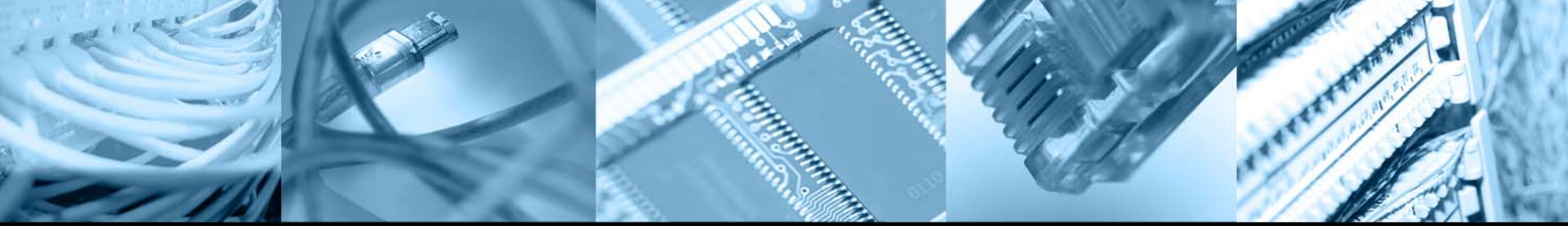
Contractor's / Manufacturer's Perspective

- "We have done interoperability testing."
- "Yes, our equipment works with other manufacturer's equipment."
- "We have deployed open architecture systems using components from different manufacturers."
- "Our equipment meets National Standards"



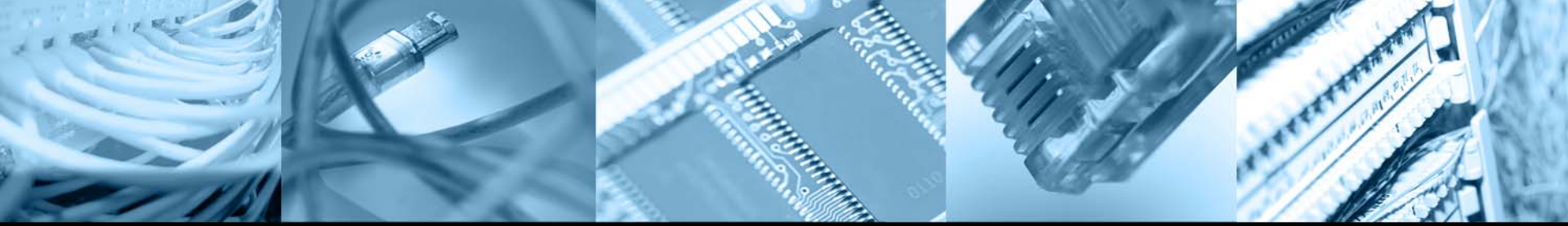
Lessons Learned

- SONET Deployment Example
- WDM Example
- Layer-2 Switch Example
- NTCIP Example



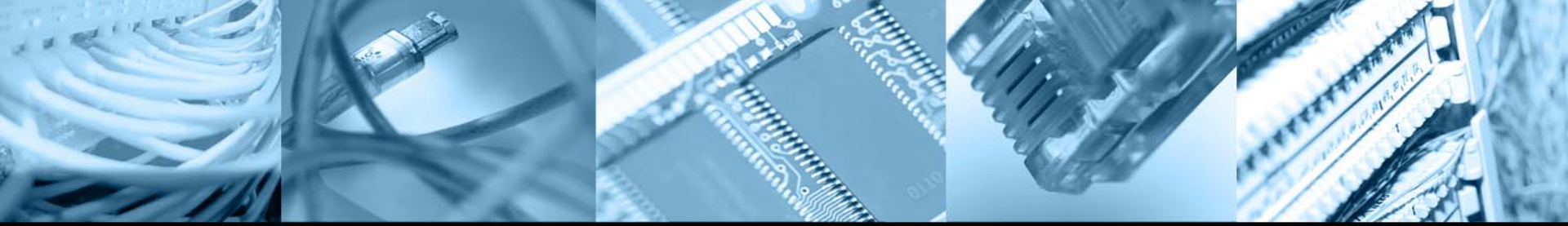
Using National Standards

- Does Referencing Standards solve all the problems?



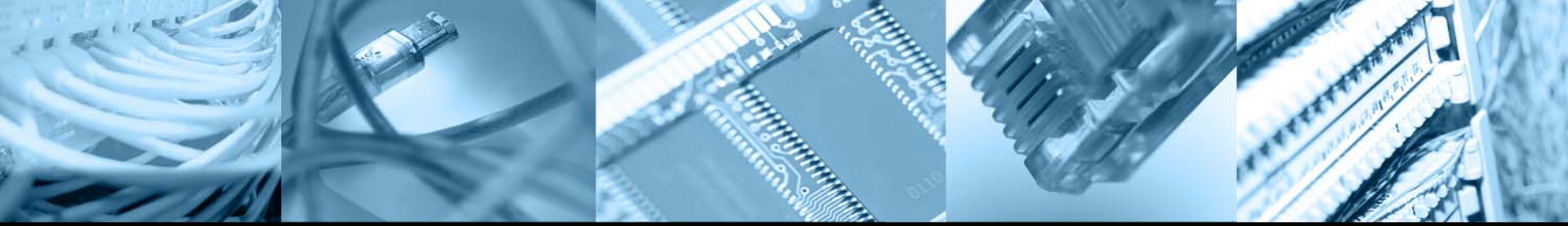
Using National Standards

- Maybe if:
 - ◆ They are referenced properly to a sufficient level of detail.
 - ◆ All the functionality you are looking for is covered by standards.
 - ◆ The industry supports the standards



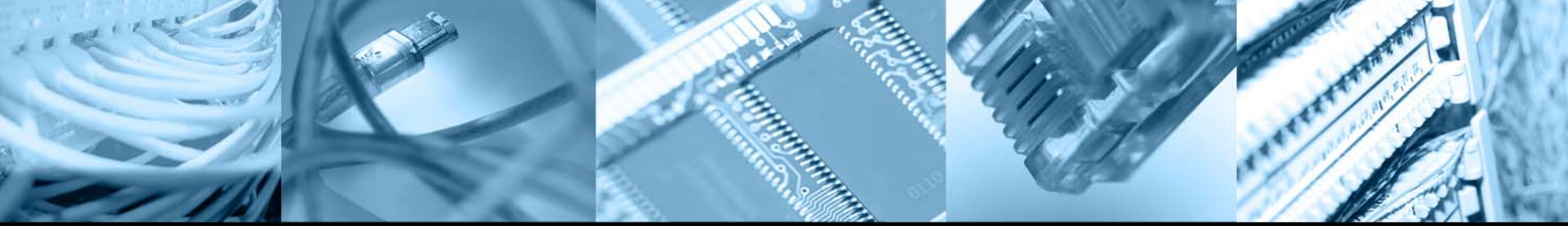
Using National Standards

- Typically not because:
 - ◆ Owner may want a specific function that is not covered by the standard.
 - ◆ The contractor is typically not required to test interoperability as part of acceptance testing
 - ◆ The industry may be implementing the standards differently (MPEG-2 example)



Design Considerations

- Clearly define all functional requirements
- Be specific about which functions are covered by standards and which functions are not
- Define the acceptance testing requirements
- Do NOT require something that can not be tested
- Avoid using the term “Interoperable” in contract documents without clearly defining what functions you are referring to



Thank you.



Kimley-Horn
and Associates, Inc.